APR 2 1955

The Monthly Evening Sky Map

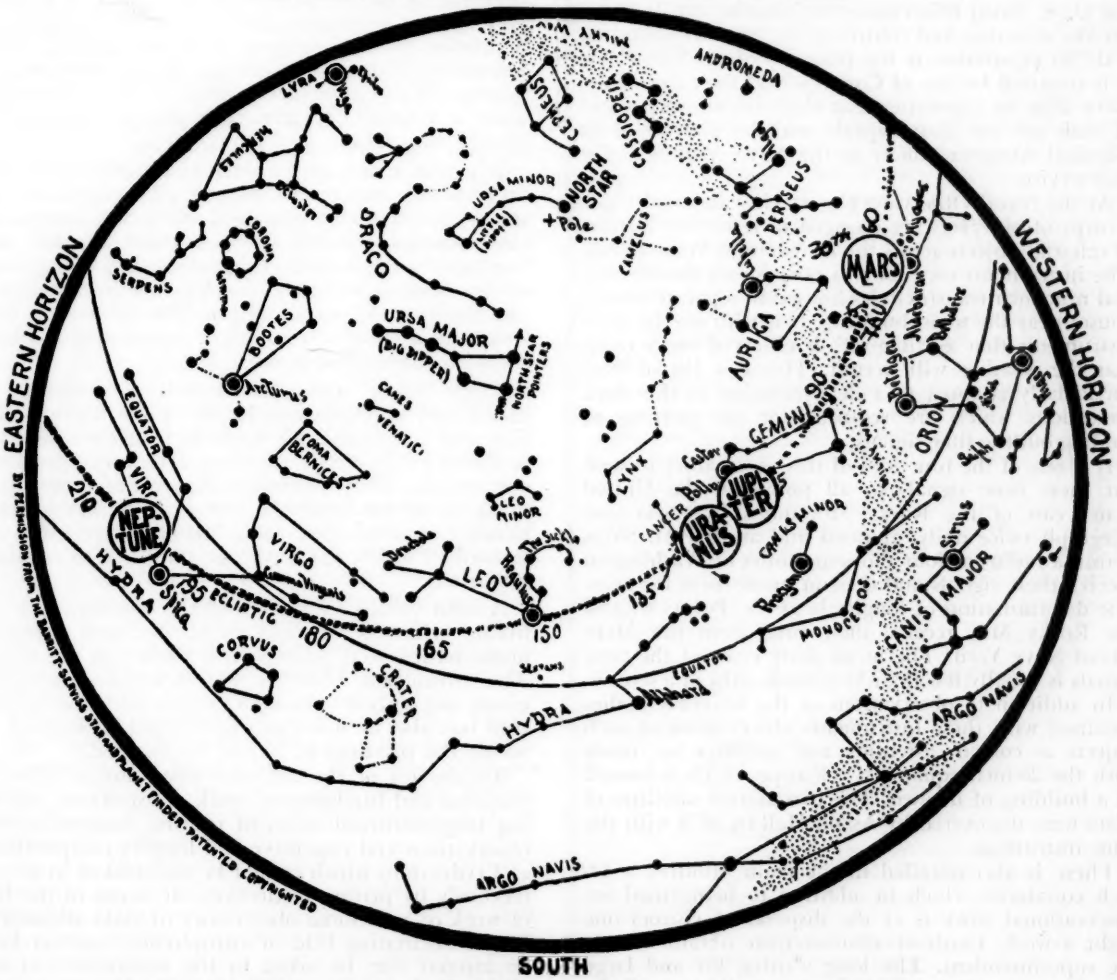
A JOURNAL FOR THE AMATEUR — FOUNDED BY THE LATE LEON BARRITT
— NORTHERN AND SOUTHERN HEMISPHERE —

ALSO A STAR, CONSTELLATION AND PLANET FINDER MAP ARRANGED FOR THE CURRENT MONTHS - APRIL - MAY - JUNE - MORNING AND EVENING - AND PRACTICALLY ANYWHERE IN THE WORLD PUBLISHED QUARTERLY

Largest Circulation of any Amateur Astronomical Journal in the World
Entered as second class matter, at Shohola, Pennsylvania, under the act of March 5, 1879

Vol. XLIX Whole No. 484 SHOHOLA, PA., APRIL-MAY-JUNE, 1955 $2.00 PER YEAR 60 Cts. Per Copy

EVENING SKY MAP FOR APRIL



AT 9:00 P.M., APRIL 1 8:00 P.M., APRIL 15 7:00 P.M., APRIL 30

Face South and Hold the Map Overhead. The Top North and You Will See the Stars and Planets Just as They Appear in the Heavens. The Arrow Through the Two Stars in the Bowl of the Big Dipper Points to the North Star. The Star at the End of the Little Dipper.

This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or South of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitude in Europe.

THE DATE BELOW EACH NUMERAL WILL SHOW THE DATE AND AN HOUR LATER FOR EACH NUMERAL WEST OF THIS DATE AND AN HOUR LATER FOR EACH NUMERAL EAST.

XUM

THE UNITED STATES NAVAL OBSERVATORY

Graphic Description of a Practical and Useful Government Bureau

All the leading nations of the world have their national observatories, maintained for the purpose of obtaining and reducing observations of the positions of the heavenly bodies and publishing yearly almanacs which give the positions of the sun, moon, planets and stars from day to day as well as much additional information of an astronomical nature essential to navigators, astronomers, surveyors and explorers.

It is the task of the astronomers at the national observatories to set the clocks of the world and furnish the data needed for the safe guidance of ships over the seas as well as for the accurate determination of national and state boundaries, the preparation of maps and charts, and the extension of astronomical discovery and research.

The national observatory of the United States is the U. S. Naval Observatory at Washington. It is under the direction and control of the Navy Department and "its reputation is the property of the Navy" for it is required by law of Congress and the rules of the Navy that its superintendent shall be a naval officer of rank not less than Captain and the director of its Nautical Almanac Officer of the Navy competent for that service.

At the Naval Observatory every clear day and night a corps of observers are engaged in recording transits of celestial objects across the meridian of Washington. The instruments used for this purpose are the six-inch and nine-inch transit circles housed in separate transit houses near the main building. It is with one of these instruments that a "time set" is observed every night that the weather will permit. This is a list of stars particularly adapted to a determination of the clock corrections which are required for the purpose of sending out the time signals.

It is one of the functions of this observatory to send out these time signals to all points in the United States east of the Rocky Mountains by radio and telegraph twice daily, at noon and at 10 P.M. Ships within a radius of four thousand miles of Washington receive these signals and depend upon them for accurate determination of longitude at sea. Points west of the Rocky Mts. receive their time from the Mare Island Navy Yard. The mean daily error of the time signals is usually less than five hundredths of a second.

In addition to observations of the heavenly bodies obtained with these instruments observations of such objects as comets, asteroids and satellites are made with the 26-inch equatorial telescope which is housed in a building of its own. The two minute satellites of Mars were discovered by Asaph Hall in 1878 with the same instrument.

There is also installed in the main building a 12-inch equatorial which in addition to being used for observational work is at the disposal of visitors one night a week. Cards of admission are obtained from the superintendent. The long waiting list and large attendance on these evenings is an indication of the desire of the general public to become personally acquainted with some of the wonders of space.

Other instruments installed at the observatory are an altazimuth, a prime vertical transit, a photographic zenith tube, for determinations of variations of latitude, a photographic telescope and a photoheliograph for obtaining photographs of the sun.

Observations made with all instruments are reduced by the observers with the assistance of a corps of computers and the results appear in the publication of the observatory and supply the data required for the preparation of improved star catalogues and tables of the sun, moon and planets. From such tables and catalogues are computed the tabulated positions of the heavenly bodies given in all almanacs.

The taking and reducing of these observations occupy most of the time of the observers and computers of the observatory. The taking of 'time sets" and their reduction for the determination of clock corrections and the sending of time signals is but a small though essential part of the work of the Naval Observatory.

An important function of the Observatory is the preparation of "The American Ephemeris and Nautical Almanac" and 'The Nautical Almanac" which is undertaken by the Nautical Almanac Office of the Naval Observatory located in the main building.

It is essential that all computers and observers of the Naval Observatory have special scientific training to fit them for their work. They must possess a college training or its equivalent in mathematics and astronomy and be skilled in computing as well. It is necessary to pass a rigorous Civil Service Commission examination in these subjects to become eligible to appointment to these positions though the compensation granted by the government for such work is no more than is granted for clerical positions requiring no special preparation.

It is also a part of the work of the Naval Observatory to test, repair and supply all navigational instruments such as gyro and magnetic compasses, chronometers, watches, sextants and binoculars that are used by the surface craft, submarines and aircraft of the Navy as well as to develop new instruments as the needs of the service require. In connection with this work a nautical instrument repair shop has been installed at the Observatory.

There is, of course, an excellent equipment of clocks and chronometers in the Time Service Division and a special clock vault in which are kept the standard clocks whose rates are determined from the star transits. These clocks are the most accurate clocks made. They are kept at a temperature that is maintained constant within one-tenth of a degree and are secured to solid piers set far in the earth to avoid all vibrations.

A most valued equipment of the observatory is the library which is believed to be the most complete mathematical and astronomical library in the world. The advantages which it affords are keenly appreciated not only by those connected with the institution but also by many others engaged in research to whom the privilege of its use is extended.

To the lot of the national observatories falls the practical and fundamental work of astronomy requiring long-continued series of routine, non-spectacular observations and expensive and lengthy computations and reductions which cannot be undertaken so advantageously by private institutions. It is not in the line of work of a national observatory to make discoveries in the fascinating field of astrophysics, however keen an interest may be taken by the astronomers at our national observatory in the spectacular progress of astrophysics of today. Yet it is some satisfaction to know that the work of our national observatory is essential to the progress of all astronomical research and that there is not an observatory in the land that is not using our "American Ephemeris" and our accurately determined time as the fundamental basis of all its work.

XUM

THE APRIL EVENING SKY

One of the first men to write about the names and lore of individual stars was Captain Henry Smyth, who in the early 1800's was an astronomer and hydrographer in the British Navy. His"Cycle of Celestial Objects" was the most widely read astronomical book of the day. Much of its popularity came from Smyth's racy, sharp-witted style. The first volume of this work is an exposition of the astronomical knowledge of the day. The writing is excellent but there is little material of interest to the modern reader except an occasional sidelight on an historic astronomical character. The second volume contains the "Bedford Catalogue" of objects of telescopic interest. The catalogue contains double star measures of the early observers and of the Herschels and of Smyth, himself. It is salted with information on the origin and history of star-names. This part of the work is invaluable to modern writers in the field and Smyth's material may be found throughout the work of such men as Serviss, Allen, and Olcott. Smyth later became a Vice Admiral and these seems to be a tacit agreement among astronomical writers to give him the full benefit of his position. None of them ever call him anything except "Admiral Smyth."

Another feature of the "Bedford Catalogue" is that Smyth gave directions for finding each of the lucid objects listed "by alignment." Your reporter has found these "alignments" for the most part accurate and more than once he has made use of them in pointing out interesting objects to persons only slightly familiar with the sky. He is passing them on in hopes that they may aid some "Sky Map" reader in picking up or checking on some puzzling April group or in pointing out these groups to less star-conscious friends.

Orion is the central figure of the Winter Hexagon, which occupies the western sky. The familiar Belt Stars are a sure identification of this group. They are roughly indicated by a line from the star marking the junction of the Handle and Bowl of the Dipper and just under the upper Pointer. The Belt Stars point down to Sirius, which should be flashing in prismatic colors low on the horizon.

Procyon (which should show an orange tinge) is the only bright star in the blank space above and east of Sirius. Some searchers for it may make use of the fact that Sirius, Betelgeux in Orion, and Procyon form an isosceles triangle. Sirius is the apex which lies between the equal sides. Still another system is to follow the line of the Belt down until it strikes Sirius, then turn up at a right angle until it practically hits Procyon.

There are any number of ways to find the Twins. A line from Rigel through the upper star in the Belt will come near Castor, while a line from Rigel between the two Belt Stars will strike Procyon, Pollux, Betelgeux at almost a right angle; certainly it is no smaller than 85 degrees.

The rest of the constellation Gemini is unusually conceived as two parallel rows of stars. The row topped by Pollux may be easily traced because it runs right down toward Betelgeux. This is especially noticeable now because the Twins are setting upright and these stars and Betelgeux make a vertical line down the western sky.

Most "Sky Map" readers must know by now that the curve of the Handle of the Dipper is continued in the southern sky by the first magnitude stars Arcturus and Spica. This is one of the most conspicuous stellar alignments. Spica may also be found by the line from Polaris through Mizar. The Dipper, Arcturus, and Spica will serve to point out both parts of Leo. A line drawn down the back of the Bowl runs through the Sickle and just passes over Regulus. Regulus is the only first magnitude star in the vicinity. The hindquarters are marked by the triagnle containing Denebola. Denebola may be identified by the large isosceles (almost equilateral) triangle it makes with Arcturus and Spica. Another check on Leo is that if you run the line of the Pointers south it passes between the Sickle and Hindquarters, just in front of the Hindquarters and parallel to the forward side of the triangle which marks them.

By means of Leo and the Dipper it is easy to locate the show piece of the April sky, Coma Berenices. Nestled under the arc of the Dipper's Handle lies a lone second magnitude star, Cor Caroli. It is roughly pointed out by a line from Polaris through the first star in the Handle Coma Berenices is half way between Cor Caroli and Denebola. It cannot be missed by anyone sweeping along this line on a good night. At first one sees a hazy group of three or four stars. Then more and more can be made out. With the smallest opera glass the cluster resolves into individuals, a tumbling swarm of tiny stars which seem to enjoy traveling in pairs. The run down in a split stream, which resembles an inverted "Y." This cluster is unquestionably the loveliest field glass object in the sky.

West of Spica may be seen the tiny but conspicuous Corvus, known to its admirers as "Spica's Spanker". (Last month we were speaking of star names that originated in the English language. This may well be one. No one seems to know much about its origin except the obvious fact that it was coined by sea-faring men.) It would be hard to miss this small, rough quadrilateral of second magnitude stars. A line from Arcturus through delta and gamma Virginis (the two stars in the curve of Virgo that are just above Spica—see the chart) runs almost down the western edge of Corvus.

Just why this group has always been associated with a Crow is not clear. The Arabs used the classical name but, as usual, they had more accurate figures of their own in the region. Four of Corvus' stars were the early "Throne of the Unarmed One"—the "Unarmed One" being Spica. Another picture here was of a Tent. But it has been so long the custom to identify these stars with a Crow that the figure will probably never be changed. One nineteenth century writer suggested that Corvus represented the raven in the story of the flood.

THE SOUTHERN CROSS

Four stars the Cross compose,
Hallowing tropic skies,
All through the night it glows,
To gladden mortal eyes.

The stars like golden nails
Transfix the Cross to night,
When darkness wanes and pales,
It vanishes from sight.

The day of toil begins,
And busy men forget
The sacrifice for sins,
Mankind's immortal debt.

Each night recalls again
The agony and scars,
Above in His domain
There gleams His Cross of stars.

—William Tyler Olcott.

XUM

$2.00 Per Year. Postpaid in the United States
PUBLISHED QUARTERLY
Subscriptions received by Booksellers and Opticians everywhere
Canada $3.00 Foreign $3.00
MRS. LEON BARRITT, Editor
Contributing Editor
Irving L. Meyer
Please make checks payable to "The Monthly Evening Sky Map"
Copyright by Maria Barritt
Box 3, Pike County, Shohola, Pa.
Telephone Milford 2310

Vol. XLIX April-May-June, 1955 No. 484

AMATEUR'S FORUM

By IRVING L. MEYER, M.S.

APRIL 1955

THE SUN: advances higher into the northern heavens, moving from Pisces into Aries. Distance from the earth is 92.8 million miles the 1st, increasing to 93.6 million miles by the 30th.

THE MOON: is at apogee (farthest from the earth) on the 11th at 252,000 miles distance, and is at perigee (closets to the earth) the 23rd at 223,000 miles.

The Moon's Phases (E.S.T.):

Full Moon	April	7 at	1:35 AM
Last quarter		15 at	6:00 AM
New Moon		22 at	8:06 AM
First quarter		28 at	11:23 PM

MERCURY: is below the equator in Aquarius the beginning of the month, but moves rapidly into the northern hemisphere crossing Pisces into Aries. It is in superior conjunction with the Sun on the 22nd, becoming an evening star at this time. Maximum distance of 124 million miles is reached the 20th. Mercury is too close to the Sun all month to be observable.

VENUS: crosses the equator into the northern skies, moving from Aquarius into Pisces. It is a morning sky object, still well placed for observation although receding from the earth. On the 1st, distance is 107 million miles, and on the 30th it is 124 million miles. However, magnitude remains almost constant at about —3.5. It will appear as a brilliant object low in the east before sunrise.

MARS: is disappearing from the evening sky. In Taurus all month, it sets only a few hours after the Sun, so is poorly placed for observation. On the 1st distance is 197 million miles, and by the 30th distance has increased to 215 million miles. It is now a second magnitude object, and apparent diameter is only 4″ (about the same as Uranus).

JUPITER: rides high in the northern heavens in Gemini. It sets at about midnight. Brilliant to the naked eye, it is a great object in the telescope, which will reveal its elliptical disc (flattened at the poles as a result of rapid rotation), shadowy bands on the disc, and its brighter satellites. On the 15th, magnitude is —1.7, apparent equatorial diameter 38″, and distance is 486 million miles.

SATURN rises: shortly after sunset. It is still a morning star, but is becoming better placed for observation daily. In Libra all month, it appears at magnitude 0.4, making it a bright visual object. On the 15th distance is 834 million miles, resulting in an apparent ring diameter of 42″ and an apparent diameter of the planet itself, of 18″. It is a striking telescopic object, best seen with powers of 150 diameters and upward.

URANUS: is also in Gemini, and pretty close to Jupiter in the evening sky. At magnitude 6 this planet can just be seen with the unaided eye. In the telescope it shows a neat, round disc about 4″ in diameter, and easily detected with powers of 50 diameters and up. Distance the 15th is 1729 million miles.

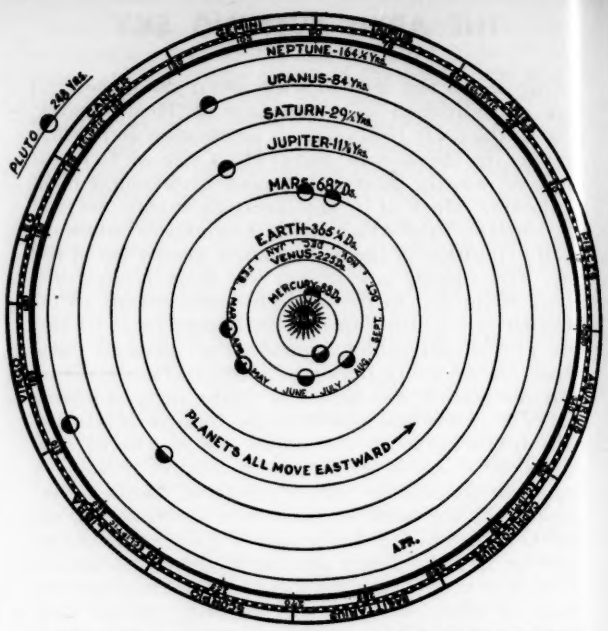
NEPTUNE: is close to Spica, in Virgo, and comes to opposition the 17th. This is a remote and faint planet (magnitude 7.7) and cannot be seen without optical aid. Distance the 19th (closest) is 2723 million miles, and apparent diameter is 2½″. To reveal this tiny, dull-gray disc, a magnification of 100 diameters and upward, is required.

PLANETARY CONFIGURATIONS

Eastern Standard Time

APRIL 1955

April 1—10:00	AM	Uranus stationary in Right Ascension
6— 2:	PM	Mercury greatest heliocentric latitude south
8— 2:37	AM	Conjunction, Neptune and Moon; Neptune north 6° 33′
9—10:23	PM	Conjunction, Saturn and Moon; Saturn north 5° 46′
11— 9:	AM	Quadrature, Jupiter and Sun
14— 4:	AM	Quadrature, Uranus and Sun
17—11:	AM	Opposition, Neptune and Sun



Orbits and Heliocentric Movements of the Planets for April

NOTE: The planets are shown in their respective orbits. Two positions, one for the first, and one for the last day of the month, are given for Mercury, Venus and Mars. The arrow indicates the last day of the month, Jupiter, Saturn, Uranus and Neptune are shown in the mean position for the current month.

20—12:20	AM	Conjunction, Venus and Moon; Venus south 7° 4′
22—10:00	AM	Conjunction, Mercury and Moon; Mercury south 5° 3′
22—11:	PM	Superior conjunction, Mercury and Sun; Mercury south 0° 28′
24— 8:51	PM	Conjunction, Marc and Moon; Mars south 0° 45′
24—11:	PM	Venus in aphelion
25— 3:	PM	Mercury in ascending node
27— 9:01	PM	Conjunction, Jupiter and Moon; Jupiter north 2° 45′
27—11:26	PM	Conjunction, Uranus and Moon; Uranus north 2° 53′
30— 6:	AM	Mercury in perihelion

AMATEUR'S FORUM

By IRVING L. MEYER, M.S.

MAY 1955

THE SUN: leaves Aries and moves into Taurus. Now high in the northern heavens, its rate of northward climb is slowing rapidly. On the 1st distance is 93.6 million miles, increasing to 94.2 by the 31st.

THE MOON: is farthest from the earth the 8th at 252,000 miles, and is closest to the earth the 21st at 222,000 miles.

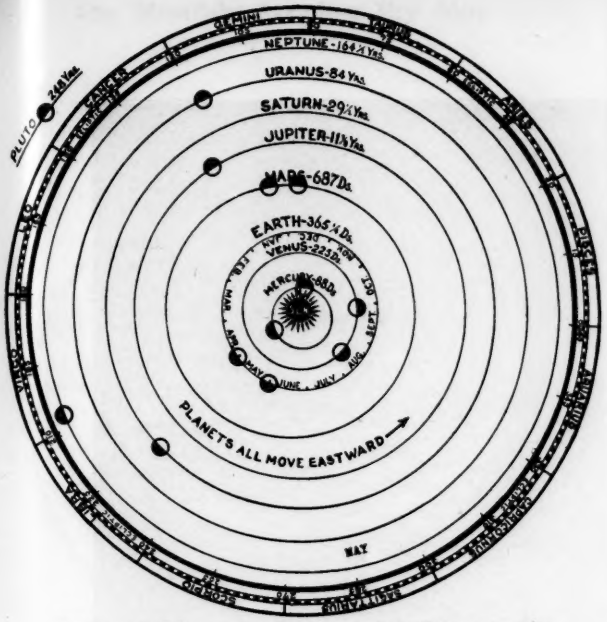
The Moon's Phases (E.S.T.):

Full Moon	May	6 at	5:14 PM
Last quarter		14 at	8:42 PM
New Moon		21 at	3:58 PM
First quarter		28 at	9:01 AM

MERCURY: in the morning sky, moves from Aries, through Taurus, to the Gemini boundary. It reaches greatest elongation east of the Sun, 22° 25′, on the 21st, and will be observable for a few days around that date. It will appear as a bright star (magnitude 0.6) low in the west in the twilight zone after sunset. In the telescope its disc will appear as a distinct crescent, and its apparent diameter of 8″ will make it noticeable with moderate magnification. Distance the 1st is 117 million miles, and the 31st is reduced to 62 million miles.

VENUS: holds forth in the morning sky, a brilliant object low in the east before sunrise. It moves from Pisces into Aries, and recedes from 125 million miles distance the 1st to 140 million miles the 31st.

MARS: is still in the evening sky, moving from Taurus into Gemini. It is now so distant that it is relatively faint (2nd magnitude) and too small in apparent diameter to permit of satisfactory telescopic observation. It sets soon after the Sun. Dis-



Orbits and Heliocentric Movements of the Planets for May

tance the 1st is 215 million miles, and the 31st is 230 million miles.

JUPITER: is a very bright evening-sky object in eastern Gemini, but it sets not long after the Sun. On the 10th it will be in very close conjunction with Uranus, being less than 1′ (approximately 1/30th the apparent diameter of the Moon) south of Uranus. This will be an excellent occasion for identifying Uranus, although optical aid will be required. Jupiter is 529 million miles away the 15th.

SATURN: comes to opposition the 9th in Libra. This planet presents one of the most remarkable sights in the heavens; its ring system is easy to detect in the smallest telescope, as is its brightest satellite, Titan. On the 9th it is closest to the earth at 826 million miles, resulting in an apparent ring diameter of 42″, equatorial diameter of the planet itself of 19″, and magnitude 0.3. The rings are widely opened as seen from earth.

URANUS: in Gemini in the evening sky, is a sixth-magnitude object. Ordinarily it can be seen with the naked eye on a moonless night, but for part of this month it will be so close to Jupiter as to be lost in the glare of that planet. Distance the 15th is 1774 million miles.

NEPTUNE: is just past observation, in Virgo, and well placed for observation. However, at magnitude 8 this giant planet is too faint for naked-eye observation, and even in the telescope is disappointing. Its tiny, dull disc can be noted with a power of 100 diameters or more. Distance the 15th is 2733 million miles.

PLANETARY CONFIGURATIONS

Eastern Standard Time

MAY 1955

May 5—	7:39 AM	Conjunction, Neptune and Moon; Neptune north 6° 36′
7—	1:22 AM	Conjunction, Saturn and Moon; Saturn north 5° 53′
9—	1: AM	Opposition, Saturn and Sun
10—	Noon	Mercury greatest heliocentric latitude north
10—	4: PM	Conjunction, Jupiter and Uranus; Jupiter south 0° 1′
17—	9: AM	Venus greatest heliocentric latitude south
19—	8:43 PM	Conjunction, Venus and Moon; Venus south 6° 19′
21—	5: PM	Mercury greatest elongation east, 22° 25′
23—	5:26 AM	Conjunction, Mercury and Moon; Mercury north 1° 46′
23—	1:07 PM	Conjunction, Mars and Moon; Mars north 1° 11′
25—	9:08 AM	Conjunction, Uranus and Moon; Uranus north 3° 7′
25—	12:16 PM	Conjunciton, Jupiter and Moon; Jupiter north 3° 16′

THE MAY EVENING SKY

The chart shows the aspect of the heavens at 9 o'clock at the beginning of May, at 8 o'clock in the middle and at 7 o'clock at the close of the month. Intermediate hours and dates are easily allowed for by the reader, simply remembering that in one hour the face of the sky revolves 15° toward the west. The distance 15° can be measured on the chart by the aid of the figures distributed along the Ecliptic. For instance the star Regulus is near the point 150° on the Ecliptic. In one hour this point will have reached the place occupied by the figures 135. So the star Spica is seen in the chart near the point 195° on the Ecliptic, but in one hour Spica will be at the place now occupied by the figures 180. Do not forget that the entire Ecliptic shifts westward with the face of the sky, so that the figures indicating the degrees on the Ecliptic always maintain the same relative positions with respect to one another and the stars near them.

At present the star Polaris, at the end of the handle of the Little Dipper, is the pole star, being out about a degree and a quarter from the true pole. This star has served to mark the north point for centuries, and will continue so to serve for centuries to come. Yet, owing to the precession of the Equinoxes the position of the real pole is continually, though slowly, changing, following a circle around the pole of the Ecliptic, which lies in the constellation Draco. It takes the North Pole about 26,000 years to complete its great circle, which has a radius of 23½ degrees. About the year 7500 A. D. the star Alpha in Cepheus will be the North Star; about 13500 A. D. the brilliantly beautiful star Vega in Lyra will hold that position; and about the year 21000 A. D. the star Alpha in Draco will again be the North Star, as it was some 4,700 years ago, when the great pyramid in Egypt was constructed with its strange telescopic-like tube, or passage, pointing to that star.

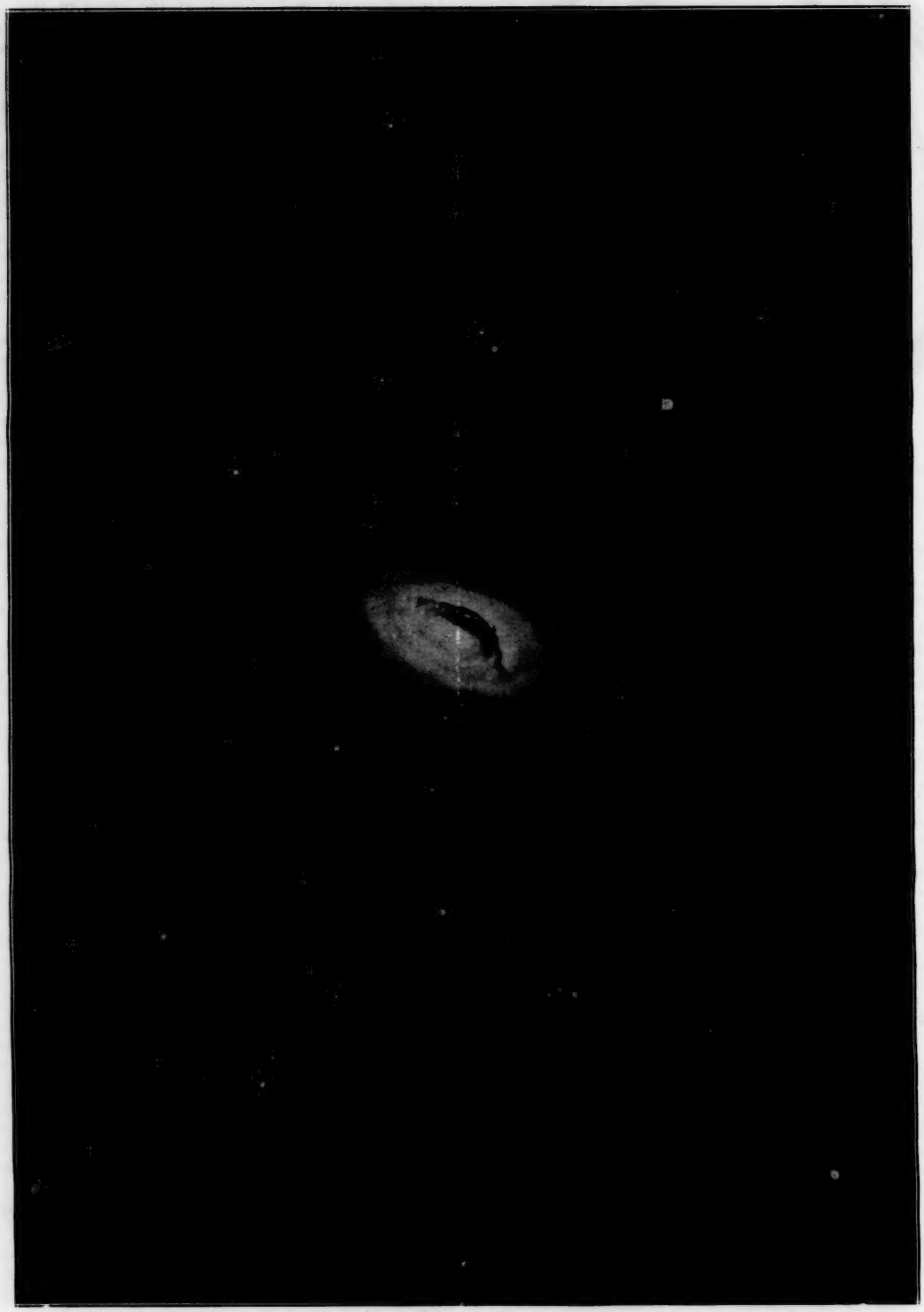
Regulus and the Sickle of Leo have passed the meridian and are well to the west of it, the Great Dipper is overhead in the north, its bowl being turned downward toward the North Star, and its handle stretching eastward. Continue with the eye the curve of the Dipper's handle toward the southeast, and at a distance about equal to the entire length of the Great Dipper the eye will be led to the brilliant Arcturus, in the constellation Bootes, which the imagination of the ancients represented under the figure of agiant with uplifted hand carrying the leash of a pair of dogs (Canis Venatici) and chasing the great bear Ursa Major in an endless circuit round the pole. Arcturus, which shows a reddish tint, particularly when near the horizon, is a sun of enormous magnitude, some estimates making it equal in illuminating power to 6,000 such suns as ours. The reason why it appears only as a star to our eyes is, of course, because of its enormous distance, amounting to two hundred million million miles! Arcturus is the brightest star north of the equator.

West of Arcturus will be seen the little constellation of Coma Berenices, some of whose minute stars are so crowded as to form a kind of hazy-looking spot. Nobody should fail to look at this with an opera glass. About as far northeast of Arcturus as Coma is west of it, glitters the beautiful Corona, or Northern Crown, whose principal stars make almost a complete circle, with their brightest member in the center of what may be regarded as the front o f the crown.

Away over in the northeast and balanced, as it were against Capella in the northwest, appears the diamond-bright Vega. In the constellation Lyra. This is

Continued on page nine

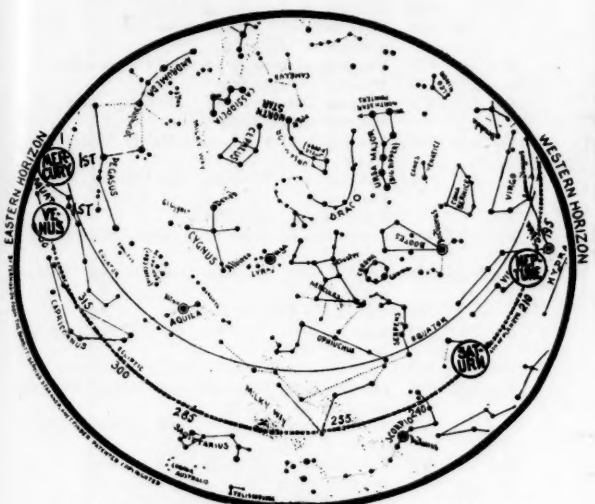
XUM



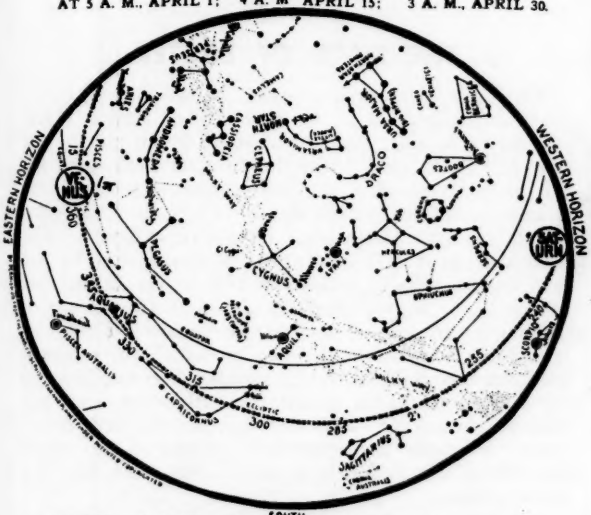
G 16, Messier 64, N.G.C. 4826, Coma Berenices, Spiral Nebula, exposure 7 hrs., 56 minutes, May 5, 6, 7, 8, 1910, 60-inch Reflector.

The Monthly Evening Sky Map

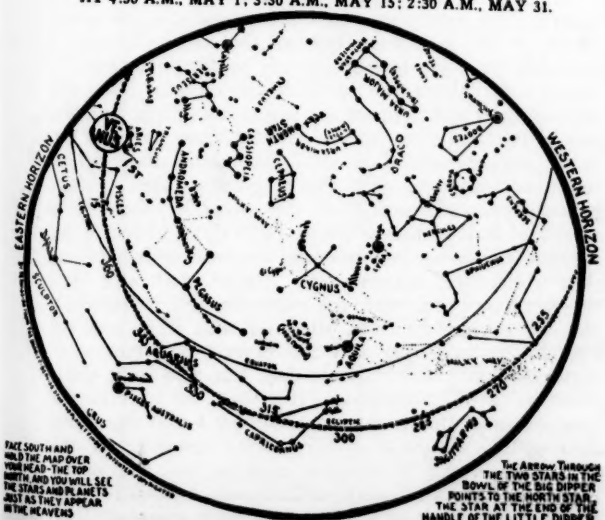
MORNING SKIES FOR APR-MAY-JUNE



AT 5 A. M., APRIL 1; 4 A. M. APRIL 15; 3 A. M., APRIL 30.



AT 4:30 A.M., MAY 1; 3:30 A.M., MAY 15; 2:30 A.M., MAY 31.



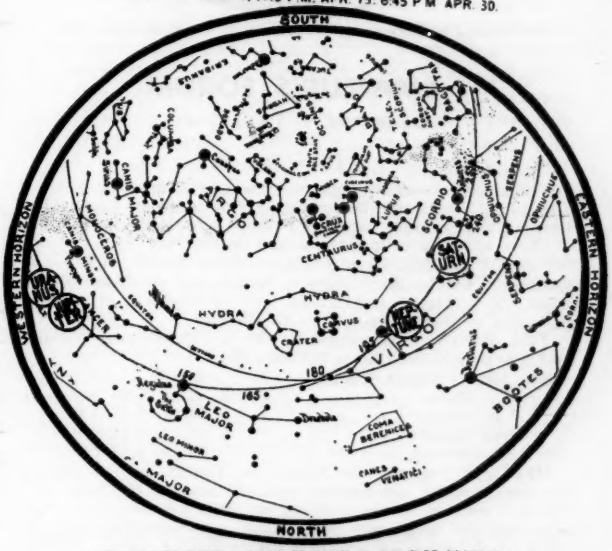
FACE SOUTH AND HOLD THE MAP OVER YOUR HEAD - THE TOP NORTH AND YOU WILL SEE THE STARS AND PLANETS JUST AS THEY APPEAR IN THE HEAVENS

THE ARROW THROUGH THE TWO STARS IN THE BOWL OF THE BIG DIPPER POINTS TO THE NORTH STAR. THE STAR AT THE END OF THE HANDLE OF THE LITTLE DIPPER.

AT 4:00 A. M., JUNE 1; 3:00 A. M., JUNE 15; 2:00 A. M., JUNE 30

Evening Sky Southern Hemispheres

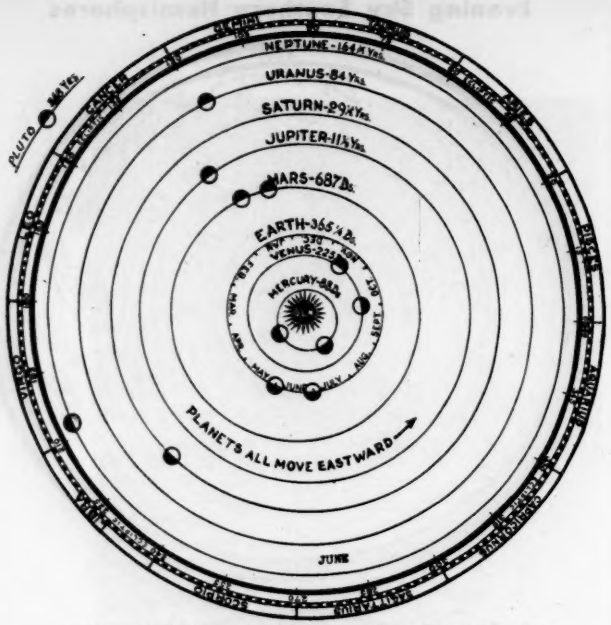
AT 8:45 P.M. APR. 1; 7:45 P.M. APR. 15; 6:45 P.M. APR. 30.



AT 9:00 P.M. MAY 1; 8:00 P.M. MAY 15; 7:00 P.M. MAY 31.

AT 8:30 P. M., JUNE 1; 7:30 P. M., JUNE 15; 6:30 P. M., JUNE 30

XUM



Orbits and Heliocentric Movements of the Planets for June

AMATEUR'S FORUM

By IRVING L. MEYER, M.S.

JUNE 1955

THE SUN: passes its high point in the northern hemisphere and turns southward this month. It moves from Taurus into Gemini, and distance increases from 94.2 to 94.4 million miles.

There is a total eclipse of the Sun on the 19th, with the path of totality crossing large stretches of the Pacific and Indian Oceans, as well as the Philippine Islands and the Malay Peninsular. As a partial this eclipse will be visible over most of Australia, southern Asia and the Middle East.

THE MOON: is at apogee the 4th at 252,000 miles distance, and is at perigee the 19th at 222,000 miles.

The Moon's Phases (E.S.T.):

Full Moon	June 5 at 9:08 AM
Last quarter	13 at 7:37 AM
New Moon	19 at 11:12 PM
First quarter	26 at 8:44 PM

MERCURY: spends the month in Taurus, in the evening sky until inferior conjunction with the Sun on the 16th, after which it appears in the morning sky. It is too close to the Sun all month for satisfactory observation. Minimum geocentric distance, 51 million miles, is reached on the 15th.

VENUS: climbs from Aries into Taurus, in the morning sky. It is such a brilliant object that it can still be picked up in the morning twilight area even though no longer well placed for observation. It continues to recede from the earth: from 140 million miles the 1st, to 151 million miles the 30th.

MARS: is a weak evening star in Gemini, close to Jupiter and Uranus by the end of the month. Still an evening star, but too close to the Sun for worthwhile observation. Distance the 1st is 231 million miles, and the 30th is 241 million miles.

JUPITER: in Cancer in the evening sky, is too close to the Sun for observation. Distance the 15th is 563 million miles.

SATURN: holds forth in Libra in the evening sky. Well placed for observation (particularly from the southern hemisphere) it is a very rewarding telescopic object in that moderate power will show the rings, cloud belts on the disc, and several satellites. Distance the 15th is 844 million miles.

URANUS: on the Cancer-Gemini boundary in the evening sky, is too close to the Sun for satisfactory observation. Distance the 15th is 1808 million miles.

NEPTUNE: moves slowly in Virgo, in the evening sky. It sets after midnight, and accordingly is well placed for observation. Magnitude is 8, hence beyond the ability of the naked eye. Distance the 15th is 2765 million miles.

THE PUBLISHER OF THE MONTHLY EVENING SKY MAP will appreciate the kindly interest of its subscribers in sending the names of those whom they think to be interested in the study of the "STARS," we will take great pleasure in sending them sample copies.

PLANETARY CONFIGURATIONS

Eastern Standard Time

JUNE 1955

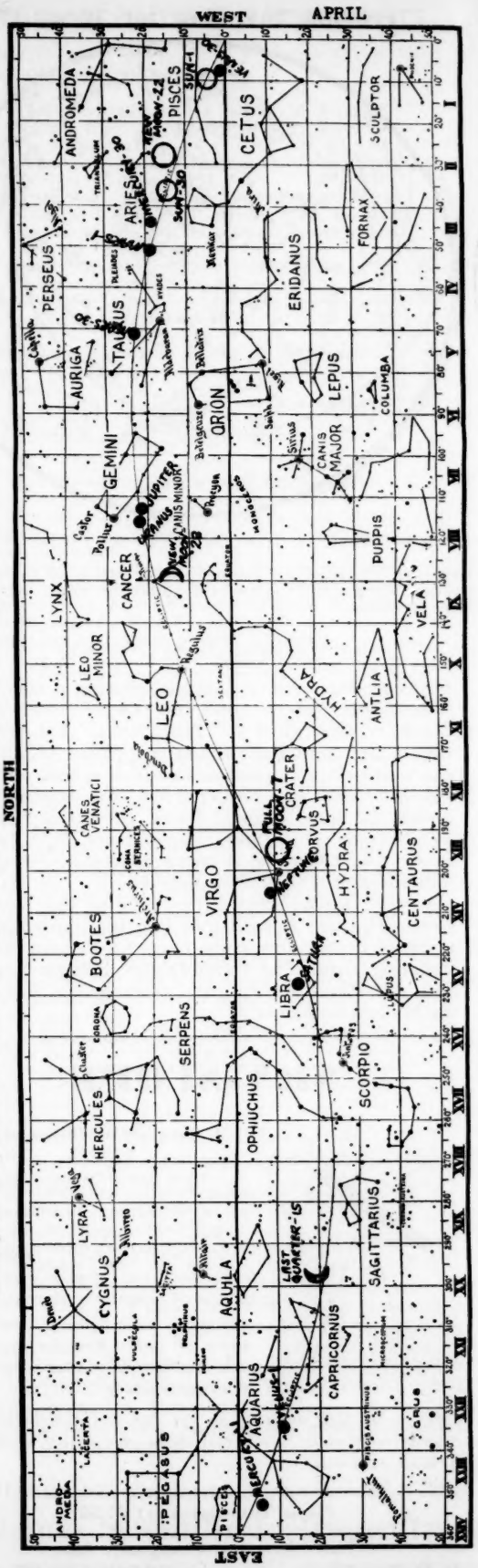
June 1—12:21 PM	Conjunction, Neptune and Moon; Neptune north 6° 42′
2—11: PM	Mercury in descending node
3— 3:40 AM	Conjunction, Saturn and Moon; Saturn north 6° 1′
3— 7: PM	Mercury stationary in Right Ascension
13— 6: AM	Mercury in aphelion
16— 1: AM	Inferior conjunction, Mercury and Sun; Mercury south 3° 31′
18— 1:51 PM	Conjunction, Venus and Moon; Venus south 2° 46′
19— 2:37 PM	Conjunction, Mercury and Moon; Mercury south 4° 31′
19—	Total eclipse of the Sun
21— 6:23 AM	Conjunction, Mars and Moon; Mars north 3° 2′
21— 9:25 PM	Conjunction, Uranus and Moon; Uranus north 3° 15′
21—11:32 PM	Sun enters Cancer; Solstice
22— 7:07 AM	Conjunction, Jupiter and Moon; Jupiter north 3° 46′
27— 7: PM	Mercury stationary in Right Ascension
28— 5:57 PM	Conjunction, Neptune and Moon; Neptune north 6° 43′
30— 3: AM	Conjunction, Mercury and Venus; Mercury south 3° 50′
30— 7:16 AM	Conjunction, Saturn and Moon; Saturn north 6° 3′

THE DATE OF EASTER

The most important problem of the annual ecclesiastical calendar is to fix the date of Easter. That famous Ecclesiastic Council of Nice, which met in the year 325 A.D., laid down the fundamental rules for this calculation that are still adhered to and the change from the Julian to the Gregorian calendar which has since taken place creates no difficulty. The basic rule, as is well known, is that Easter shall be the first Sunday which follows a full moon falling on March 21 or next thereafter, *i. e.*, a full moon on or following the date of the vernal equinox. They also laid down a rule that the day on which the moon is fourteen days old shall be considered as the date of the full moon. This ecclesiastic full moon does not therefore coincide with the astronomic full moon phase. In using the astronomic phases of the moon one should count fourteen days ahead from the new moon phase.

It is interesting to note that the exact time elapsing between the astronomic new moon and the full moon phase is about fifteen days at this time. This is a variable quantity owing directly to the fact that the lunar orbit about the earth is not circular but, like that of the earth around the sun, is an ellipse and the moon has different speeds in different parts of its orbit, and the moon is not at the same place on its orbit at successive full moon phases. The average synodic or phase period of the moon is about 29.53 days and half of this is about 14.76 days, which is the average age of the moon at the astronomic full phase. The difference between the August full and new moon phases this year, for example, will be slightly less than fourteen days, showing that it is possible for the ecclesiastical and astronomic full moons to come not only on the same date but also even quite close in actual occurrence. It is not, we may say in conclusion of this note, to be supposed that the members of the Council of Nice, were ignorant of the difference which they were making, for the movements of the moon were well enough known for this purpose hundreds of years before their meeting.

A MERCATOR PROJECTION OF THE STAR FIELD FOR 50 DEGREES NORTH AND 65 SOUTH OF THE EQUATOR



A MERCATOR PROJECTION OF THE STAR FIELD FOR 50 DEGREES NORTH AND 65 SOUTH OF THE EQUATOR

The Star Field makes an apparent complete revolution westward every 24 hours, hence the hourly division from I to XXIV, but this has no relation to the time that any portion of the map is in view. Practical as a Star, Constellation and Planet Finder for the current month—April—Anywhere in the world.

Showing also the position of the Sun at the beginning and ending of the month and the position of the Moon at its several phases.

THE MAY EVENING SKIES

Continued from page five

a star of brilliant beauty, which has been admired of mankind in all ages. The contrast between its color and that of its great rival for the first rank among northern stars. Arcturus, will immediately strike the observer's eye. Two fourth-magnitude stars, making a perfect little triangle with Vega, will be noticed. The northernmost of these two little stars is the celebrated quadruple Epsilon. With the slightest optical aid this star will appear double and a good telescope of three or four inches aperture will separate each of the two into more. The sight is very attractive when a strong telescope is employed. The famous Ring Nebula is also in the constellation Lyra, not far from Vega, but it is solely a telescopic object, and those who wish to observe it should consult a work like the "Pleasures of the Telescope."

Between Corona and Lyra lies the constellation Hercules easily recognized by a somewhat irregular quadrangle marked out by four stars near the center of the constellation. Between the two stars forming the western side of this figure, and about one-third of the way from the northern toward the southern stars, is situated the great star cluster of Hercules. It is invisible to the naked eye, but may be seen as a faint speck with a good opera class, while in a powerful telescope it is an object of marvellous splendor. It consists of many thousands of minute stars closely packed together, so that in the center they run into an indistinquishable blaze of intermingled rays. Next to one in the Southern hemisphere, in the constellation Centaurus, this is the richest star cluster known.

A very beautiful double star may be pointed out for those who have telescopes. It is the star Epsilon in Bootes. It may be recognized on the chart as the first star above Arcturus on the east side of the kite-shaped figure which has Arcturus at its lower point. A magnifying power of about 100 diameters should be employed. The components of the double are of the second and sixth magnitudes, respectively, their distance is less than three seconds of arc, and their colors are most beautifully contrasted, the larger star being yellow and the smaller brilliantly blue, or blue-green.

ONE OF OUR SUBSCRIBERS WRITES

My Dear Madam:

If this will not be too much asking of you a few questions which have puzzled me for quite a long time. I am very grateful for having received The Sky Map as a Christmas Present; and, since I find it a source of great pleasure, I am taking the liberty of asking these questions. Can you tell me the correct name of the discoverer of the ninth satellite of Jupiter? What is a variable Star? and, What is the extreme limit for the swing of the Sun north in June and south in December for the latitude of New York, expressed in degrees?

Thanks,

Mrs. D. W. Christofsen
N. Y. C.

The ninth satellite of Jupiter was discovered by Mr. S. B. Nicholson at the Lick Observatory, July 21, 1914 on photographs made for the study of the eight satellites with the Crossley reflector.

A variable star is one of whose brightness of magnitude changes periodically or non-periodically. "Novae" or new stars are included in this term. Variable stars are themselves grouped according to the manner in which their brightness changes. Some stars are variable periodically with long periods, some with short, some vary as if they were undergoing periodic eclipse, and others continuously, while not a few change quite irregularly. The word "variable" is never used to refer to positions changes.

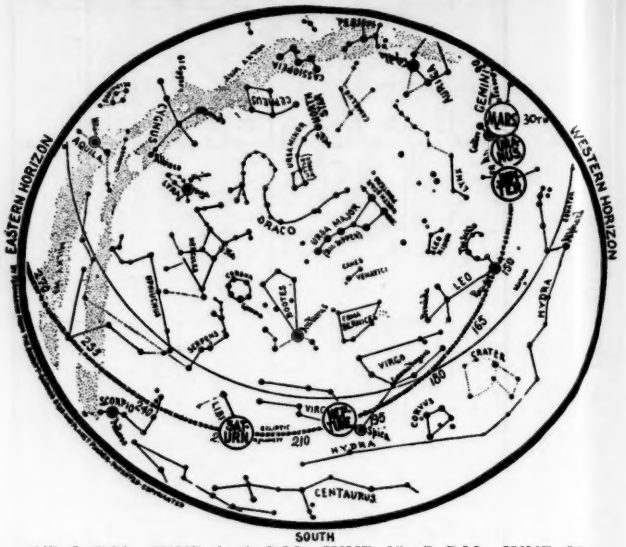
To your third question. About 31 degrees in each direction from east and west points of the horizon.

XUM

Evening Sky Map for May, 1955

AT 9:00 P.M.; MAY 1; 8:00 P.M., MAY 15; 7:00 P.M., MAY 28

Evening Sky Map for June, 1955



AT 9 P.M., JUNE 1; 8 P.M., JUNE 15; 7 P.M., JUNE 28

This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or South of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitude in Europe.

JUNE EVENING SKIES

The most beautiful constellation in the southern part of the sky in the June evenings are *Leo, Corvus* and *Virgo*. The "Sickle" of *Leo* is seen west of the Meridian: then much lower in the south appears the striking quadrilateral of *Corvus*, and directly south, at a convenient elevation for observation is *Virgo* with the brilliant *Spica*, its brightest star, glowing like a diamond of the purest water. *Spica*, which appears as a single star in the most powerful telescopes, is nevertheless a double, belonging to the class known as "spectroscopic binaries" because the companion body is dark and its presence is revealed only by the shifting lines in the spectrum, the motion of the lines being caused by the alternate approach and recession of the bright star as it swings around and round with its invisible companion. But the ordinary spectator, having no telescope and no spectroscope at command, will nevertheless be interested in the extreme beauty of *Spica*, a scintillating point of the purest white light. Its brilliancy combined with its great distance proves that it is one of the most powerful radiant bodies in the universe. In a former article I have described the double star *Gamma Virginis*, which may be seen double with any amateur's telescope. It is ten degrees west of *Spica* and is exactly on the equator of our map.

Away over in the southeast appears one of the most remarkable of the constellations, *Scorpio*, marked by the presence of a brilliant red star of the first magnitude—*Antares*. This also is a double, which may be separated with a telescope of four inches aperture. The small companion star is of a rich green color, contrasting beautifully with the red hue of its greater neighbor. But it can be better seen in July when it is nearer the Meridian and farther removed from the mists and the unsteady air of the horizon.

High overhead, following the handle of the *Great Dipper*, is the splendid constellation *Bootes*, represented in some of old pictured charts of the heavens in the form of a tall man holding by a leash a pair of hunting dogs and apparently chasing *Ursa Major (The Great Bear)* around the pole. For this reason *Bootes* is often called the "Bear Driver." The brightest star in the constellation, and one of the brightest in the whole sky, is *Arcturus*, to which special reference has been made in a former article. The reader should notice the huge triangle whose corners are marked by *Arcturus, Spica* and *Denebola* (or *Beta Leonis*), in *Leo*. The distance between *Spica* and *Arcturus* is somewhat more than thirty degrees.

East of *Bootes* shines the circle of the *Northern Crown (Corona Borealis)*, and in the northeast with resplendent rays glitters the beautiful *Vega* in the constellation *Lyra*. The *Great Dipper* is high overhead with handle to the east, and *Cassiopeia* is low upon the horizon in the north.

SKY-SCOPE

Complete as illustrated
$29.75

The full 3½" diameter reflecting type, Astronomical telescope that is sweeping the country. Shows Moon craters, Saturn's Ring, Jupiter's 4 moons and close "double stars" with guaranteed observatory clearness.

It has a tested ¼-wave aluminized mirror, 60 power Ramsden type eyepiece and is equatorially mounted on an all-metal stand.

We invite your attention to our free and straight forward descriptive brochure which also shows photographs of the individual parts used.

(125 & 35 power extra eye-pieces are available at $5.15 ea.)
Finder (with brackets) $7.50

The Skyscope Company, Inc.
P. O. Box 55 BROOKLYN 28, N. Y.

Page Ten

HAINES SCIENTIFIC INSTRUMENTS

Presents . . .

SPRINGFIELD MOUNTING

A fixed eyepiece mounting Springfield Type. 12" Cassegrain telescope balanced at the Declination axis in 3" ball bearings.
Polar axis also in ball bearings and poised by a "pendulum" counterweight.
16" aluminum disk circles graduated to single minutes for R.A. and S.T. and 15' of arc for Dec. Double focussing—both by secondary mirror and at eyepiece.
Accurate Sideral Time drive with a rating of six seconds per year maximum.
Slow motions in both axes operated by motors and controlled at a hand panel at the end of an electric cable.
15" bronze worm gears of 24 pitch 360 teeth stainless steel worms. Exposed steel parts plated against moisture.
Sideral Clock attached near the observer's chair (below the fixed eyepiece).
Total shipping weight 600 lbs.

WHAT IS SIDERAL TIME?

The Sideral Clock is a necessity for every observatory for checking the R.A. of the Stars.

For this purpose pendulum clocks must be very accurate with a rating of only a few seconds deviation in a month.

Special clocks are made for the electric power houses to keep control of the frequencies of the great electric generators supplying power to instruments of industry which require that frequencies must not vary beyond specific tolerances.

The HAINES ELECTRIC SIDERAL CLOCKS are made to accommodate those frequencies and by means of special gearing to convert from Standard Time to Sideral Time, that is to say, from keeping the time of the Sun to keeping the time of the stars.

Astronomers have two sources of data from which to compute Local Sideral Time, The American Ephemeris, published at Washington ($3.75) Superintendent of Documents and The Observer's Handbook, a small volume published by the Royal Astronomical Society of Canada, 3 Willcocks St., Toronto, 60 cents. Greenwich Sideral Time in the Ephemeris pages 2 to 16 and in the Handbook on page 7.

Local Sideral Time which is required in the observatory can be computed from two formulas published in advertising in The Monthly Evening Sky Map and the Observer's Handbook or will be sent to any address upon request and with an example worked out for that location free of charge. Information in the method of using Sideral Time will also be sent free.

HAINES ELECTRIC SIDERAL CLOCKS will keep accurate Time with a computed rating of less than 6 seconds deviation a year from time of precise rotation of the earth with respect to the Sideral Universe.

ELECTRIC SIDERAL CLOCK

With a computed rating of less than one minute slow in sixteen years.
Circle with degree graduations suitable for navigators who make use of the Vernal Equinox in calculating Sideral Time.
Especially designed for Astronomers, and Observatories and has the numbers 0 to 23 or from 1 to 0—twenty four hours.

Price Delivered
$40.00

We are especially equipped to design and build to your specifications all types of scientific equipment for Observatories, Museums, etc.
For further information regarding any Special Equipment Built to Your Specification

Kindly write to

Haines Scientific Instruments

Box 171 **Englewood, N. J.**

The STAR FINDER which is 6 x 8 in size, plastic coated, beautiful in appearance and will last a lifetime. By turning the center disk to the corresponding date or month and hour you will see the STARS in the position they occupy in the Northern Sky, with the POINTER STARS guiding you to the NORTH STAR. 75 cts postpaid.
Kindly mail your orders early as requests for these items are in great demand.

Available Until June 30, 1955

No. 1—Two years' subscription to the Monthly Evening Sky Map, $3.50; one Barritt's Star and Planet Finder with new book of Planet Table and Planet Disks, $7.00, one Barritts' Celestial Album containing 160 photographs, $5.00; one book, Romance of the Astronomers, $1.00, total $16.50. All can be obtained as a special gift to any of your friends for $10.00.

No. 2—Two years' subscription to The Monthly Evening Sky Map, $3.50; Barritt's Celestial Album, 160 photographs, $5.00; Romance of the Astronomers, $1.00; total $9.50. All can be obtained for only $7.00.

The Barritt-Serviss STAR and PLANET FINDER

Collaborated by Leon Barritt and Garrett P. Serviss
Patented and Copyrighted

The Planets, the Sun and the Moon are made to move through their regular orbits by an ingenious system of Disks which are entered upon the map at stated periods by a simply arranged system of Tables extending over a period of years, so that their true positions are located at the date of entry, enabling anyone to follow the progress of these great travelers of the sky with delight and intellectual profit. Tells their time of rising and setting.

The Chart is 15 x 15 inches square and has a revolving disk map showing all the stars visible to the naked eye in the Northern Hemisphere, down to the 4th magnitude. The map is arranged specially for Latitude 40, North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitudes in Europe.

It is made of heavy cardboard, mounted and with any sort of fair usage should last a lifetime. It has a strong, firmly attached metal hanger and will make a striking and attractive appearance upon the wall of any library.

Students of Aviation, Navigation, and Science will find the Star and Planet Finder of utmost importance in their studies.

Recommended and used by Aviators, Navigators, Engineers, Surveyors and those interested in Astronomy. Price $7.00
For a limited time only we are reducing our cost on this finder to $6.00 postpaid.

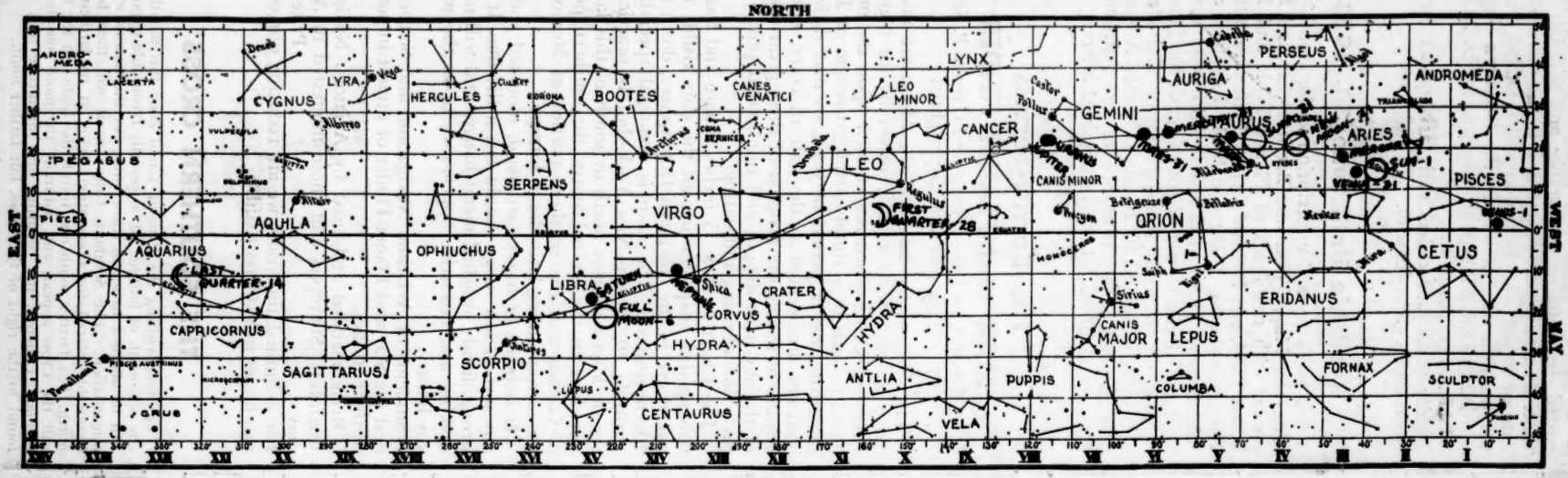
THE SOUTHERN CROSS

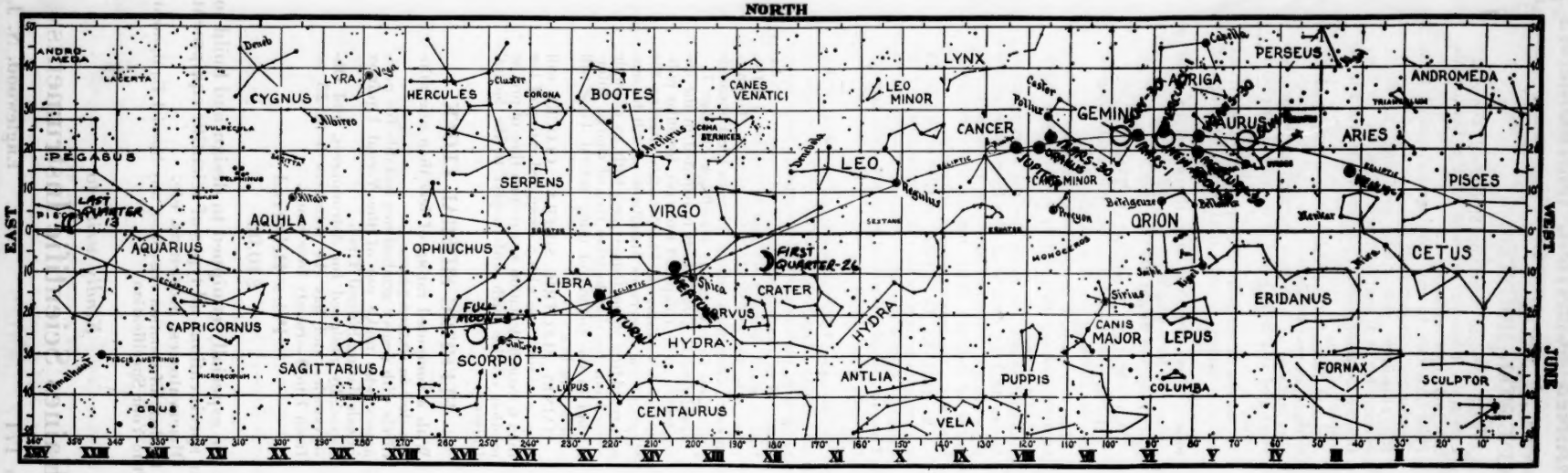
To those visiting the Panama Canal Zone this month or to any one south of latitude 20, a specially favourable opportunity will be afforded to see in the evening sky the famous southern constellation, "The Southern Cross" as it will then be most favourably placed for observation, being at its farthest point north. The farther south one travels the higher in the heavens will the Cross appear, and naturally the more conspicuous it becomes. Canopus, the beautiful first magnitude star, will be found to the right of the Cross, but farther south.

A MERCATOR PROJECTION OF THE STAR FIELD FOR 50 DEGREES NORTH AND 65 SOUTH OF THE EQUATOR

The Star Field makes an apparent complete revolution westward every 24 hours, hence the hourly division from I to XXIV, but this has no relation to the time that any portion of the map is in view. Practical as a Star, Constellation and Planet Finder for the current months—May-June, 1955—Anywhere in the world.

Showing also the position of the Sun at the beginning and ending of the month and the position of the Moon at its several phases.





Nov. 5 Oct. 22 Oct. 5 Sept. 20 Sept. 5 Aug. 20 Aug. 5 July 20 July 5 June 20 June 5 May 20 May 5 Apr. 20 Apr. 5 Mar. 20 Mar. 5 Feb. 18 Feb. 2 Jan. 20 Jan. 5 Dec. 20 Dec. 5 Nov. 20

THE DATE BELOW EACH NUMERAL WILL SHOW WHEN THAT SECTION OF THE MAP WILL BE ON THE MERIDIAN—DUE SOUTH—AT 9 P.M. OR AN HOUR EARLIER FOR EACH NUMERAL WEST OF THIS DATE AND AN HOUR LATER FOR EACH NUMERAL EAST.

XUM